LLM Automated Evaluation Results

**Functional Requirement Evaluation Report**

Based on the rules and instructions provided by the user, I conducted a detailed analysis of the requirement document. The evaluation process is as follows:

1. **Data Entity Identification**:  
   Only data entities that need to be managed within the system (i.e., stored in the database or processed by the system core) are counted. External interfaces (e.g., external data sources or formats) are excluded. The core data entities extracted from the functional requirements include:
   * Normalized Data (from FR-001)
   * Processed Data (including traffic metrics, incident details, from FR-002)
   * Cached Data (from FR-003)
   * Archived Data (from FR-003)
   * Published Data (from FR-004)
   * Alert (from FR-004)
   * User Account (from FR-007)
   * User Role (from FR-007)
   * Anomaly Report (from FR-008)
   * Quality Score (from FR-008)
   * System Health Data (from FR-009)
   * Subscription Data (from FR-010)  
     Total number of data entities: **12**. These entities are interconnected in the E-R diagram (e.g., Normalized Data is processed into Processed Data, which is then used for caching, publishing, etc.), ensuring a weakly connected system architecture.
2. **Functional Requirement Merging and Elimination**:
   * **Merging Rule**: Requirements referring to the same function on the same entity are merged (e.g., multiple approval rules). However, analysis shows all requirements refer to different entities or operations, so no merging opportunities (e.g., FR-001 is about data ingestion, FR-002 is about data processing—different operations).
   * **Elimination Rule**: System-wide setting requirements (e.g., language support, responsive design) are eliminated. Eliminated items:
     + FR-011 (Multilingual Support): general UI setting
     + FR-012 (Responsive Design): general mobile adaptation
   * Retained requirements: FR-001 to FR-010 and FR-013 (third-party system integration, considered core functionality).  
     Final number of functional requirements after merging/elimination: **11**.
3. **Hallucinated Requirement Determination**:
   * **Standard**: A hallucinated requirement introduces a data entity that cannot be linked to any existing entity, making the E-R diagram not weakly connected (i.e., isolated node exists). Only if the data entity is completely detached is it considered hallucinated.
   * **Evaluation**: All requirements involve data entities that can be connected (e.g., user management entities for access control, subscription entities for data push). No hallucinated requirements found.

Evaluation table is as follows (each requirement assessed one by one):

FR-001 | Data Collection and Ingestion | No | Involves "Normalized Data" entity, linked to core database; input (raw data) and output (structured data) are defined via external interface.  
FR-002 | Data Processing and Analysis | No | Involves "Processed Data" entity, input from FR-001; output metrics (e.g., congestion levels) are clearly defined.  
FR-003 | Dynamic Caching and Archiving | No | Involves "Cached Data" and "Archived Data" entities, input from FR-002; output is defined in the requirement.  
FR-004 | Data Publication and Export | No | Involves "Published Data" and "Alert" entities, input from FR-002; output formats (e.g., SAE J2354) defined via external interface.  
FR-005 | Web-Based User Interface | No | Uses existing data entities (e.g., traffic data), no new entities; input (user request) and output (interactive view) defined.  
FR-006 | Configuration and Extensibility | No | Involves system configuration, no isolated entities; mentions "new data sources" and "pluggable modules" without full specification (incomplete).  
FR-007 | User Management and Access Control | No | Involves "User Account" and "User Role" entities, used for system access; input (login request) and output (access rights) defined.  
FR-008 | Data Quality Checking and Anomaly Handling | No | Involves "Anomaly Report" and "Quality Score" entities, input from raw/processed data; output defined.  
FR-009 | Real-Time Monitoring and System Health | No | Involves "System Health Data" entity, input (system status) and output (dashboard) are defined.  
FR-010 | Data Subscription and Push Services | No | Involves "Subscription Data" entity, input (subscription request) and output (data push) are defined.  
FR-013 | Third-Party System Integration Interface | No | Involves integration operations, no new internal entity; input (integration request) and output (external data) defined in external interface.

**Summary**

* **Total data entities involved: 12**  
  (Normalized Data, Processed Data, Cached Data, Archived Data, Published Data, Alert, User Account, User Role, Anomaly Report, Quality Score, System Health Data, Subscription Data)
* **Total functional requirements after merging and elimination: 11**  
  (FR-011 and FR-012 eliminated as general settings; no merged items—all requirements at consistent granularity)
* **Number of hallucinated requirements: 0**  
  (All requirements have weakly connected data entities in E-R diagram; no isolated nodes)
* **Number of non-hallucinated requirements: 11**  
  (All retained requirements are non-hallucinated)